



Wildlife Impacts & Wind Farms with an emphasis on the Indiana Bat

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Wind Farms

- Wind Farms are:
 - Renewable Energy
 - Pollution Free
 - Green Technology
- Wind farms have recently experienced dramatic growth & more expected with US DOE 2020 goal of 5% electricity from wind power in United States
- **Wind Farms require:**
 - Planning – Construction – Monitoring
 - Local and/or State Regulatory Approval on Private Lands



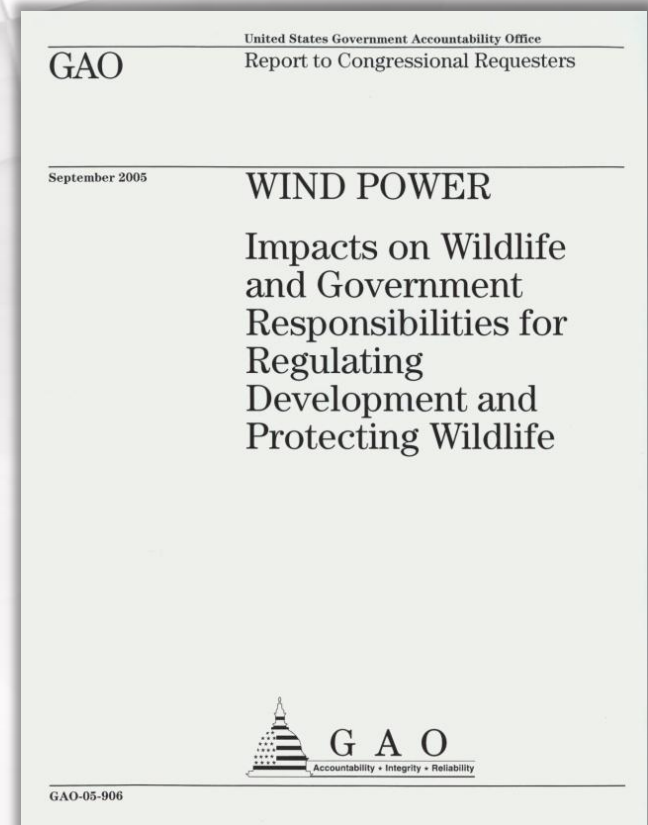
Wildlife Impacts

- Much is good in wind energy; however, fatalities in birds and bats have been recorded
- U.S. Government Accountability Office (GAO) in September 2005 assessed:
 - available studies and experts and what can be done to mitigate or prevent such impacts;
 - roles and responsibilities of government agencies in regulating wind power facilities; and
 - roles and responsibilities of government agencies in protecting wildlife.



GAO Recommendations

- Recommendations were:
 - That USFWS provide state and local regulatory agencies with information on the potential wildlife impacts from wind power and the resources available to help make decisions about where wind power development should be approved.
 - The Department of the Interior agreed with GAO's recommendation.



Considerations (GAO)



- Wildlife Mortality varies by Region and by species (e.g., raptors and migratory tree bats)
- Notable gaps exist in literature & few studies address migration.
 - Few Post-Construction monitoring studies
 - What factors increase the chances of wildlife impacts?
 - Lack of complete and definitive information on the interaction of bats and wind turbines (e.g., Random, Coincidental, or Attraction Theories)
- State and/or Local Governments regulate Wind Power on Non-Federal lands
- Bats are more prone to fatalities at lower wind speeds

More Recent News

- More research (e.g., cooperatives, partnerships, USGS, universities/colleges, and independent) are involved in studying & recommending:
 - Seasonal/daily low wind shutdowns or an assigned wind speed start-up
 - More upfront biological/landscape data in planning phase
 - More monitoring of constructed wind farms
 - Consideration of Direct and Cumulative impacts (e.g., white nose syndrome)
 - Barotrauma in bats



Federal/Private Lands

- NEPA would apply on federal lands including Section 7 Consultation (USFWS)
- On private and federal lands, the USFWS implements wildlife protection in the United States by 3 federal laws which forbid harm to various species.

They are:

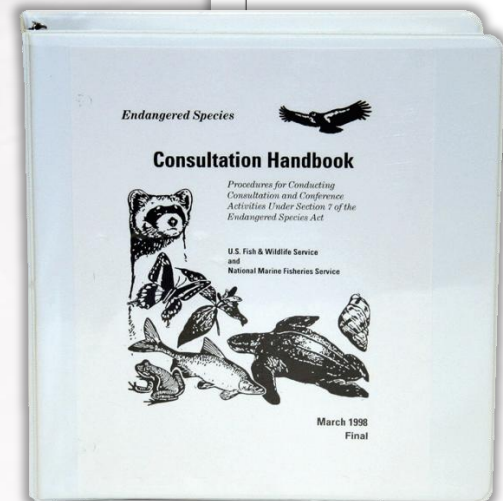
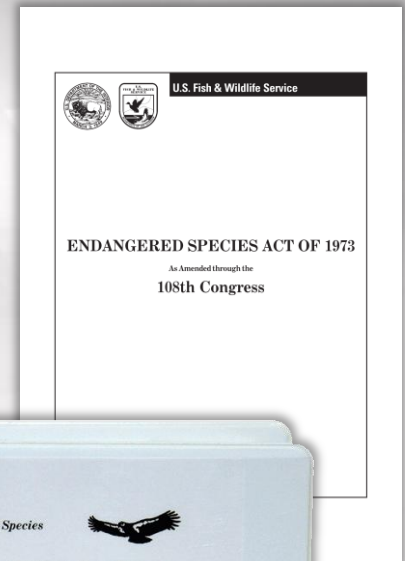
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act
- Endangered Species Act



**Coordinate with USFWS and other agencies, as appropriate, in planning.*

Endangered Species Act (ESA)

- Law requires that agencies take into account their actions upon federally endangered and threatened species.
- Section 7 Consultation is required for any federal agency that permits, licenses, funds, or otherwise authorizes activities; they must also consult with the United States Fish and Wildlife Service (USFWS) to insure that its actions will not jeopardize the continued existence of any listed species.



Indiana Bat

- In Indiana, the Indiana bat is a federally listed species.

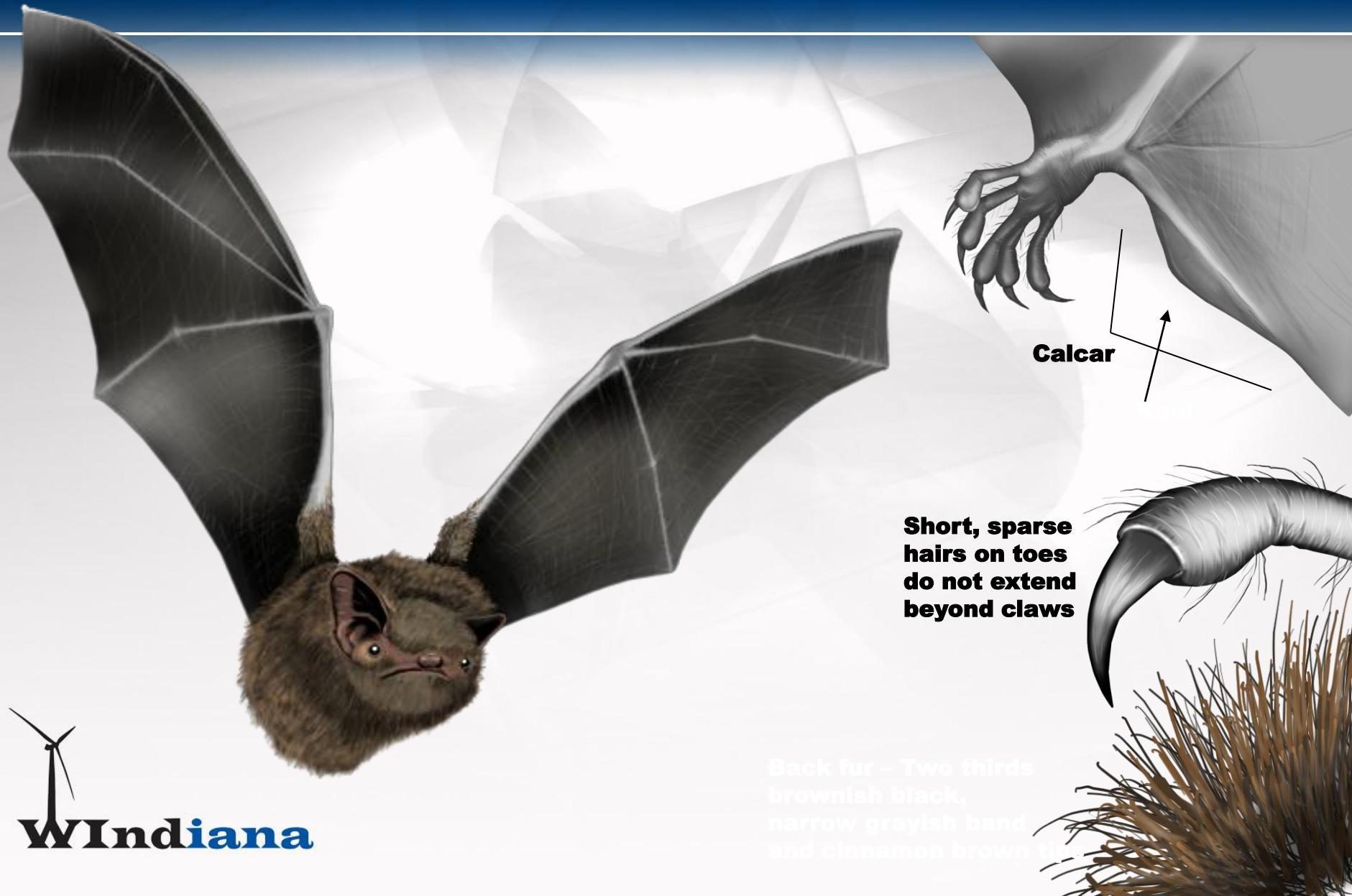


Indiana Bat
Direct Impact
Direct Impact



White Nose Bat
Cumulative Impact

Indiana Bat



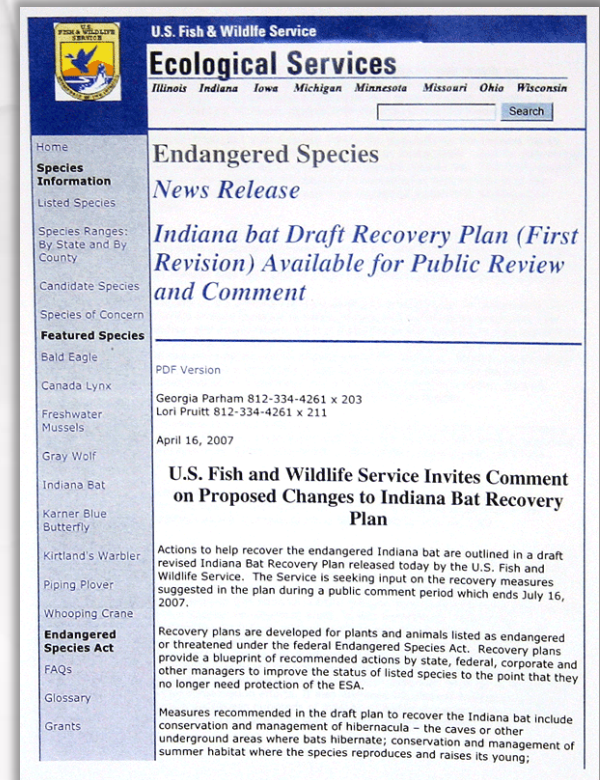
Calcar

**Short, sparse
hairs on toes
do not extend
beyond claws**

Back fur – Two thirds
brownish black,
narrow grayish band
and cinnamon brown

Indiana Bat - Status

- Federally endangered species
- Population declines and vulnerability to human disturbances in winter have prompted its listing by the USFWS in 1967
- A Recovery Plan was developed in 1976 and revised in 1983
- A new revision to the Plan is presently underway
- Geographic Range – 16 States with majority in Indiana



Indiana Bat - Feeding

- Eats aquatic and terrestrial flying insects at night.
- Benefits people by consuming many insects that are considered pests.
- May eat half their weight a night in insects.
- Examples are moths, beetles, midges, flies, wasps, flying ants, weevils, etc.



Cut Worm



Spotted Cucumber Beetle



Gypsy Moth



Midges

Summer Habitat

- Shaggy barked or dead trees with exfoliating bark in bottomlands near uplands (e.g., shagbark hickory)
- Stream locations serve as flyways as do some forested paths and haul roads
- Bridges can be used (especially concrete) for roosting, mating and nurseries
- Spring Migration – Late March to May
- Fall Migration – August to November



Winter Habitat

- Caves or mines in Indiana
- Fidelity for certain caves
- Caves need to be constant and cool in temperature
- Well-Ventilated with chimney effect
- Spring Staging (Feeding) at Caves
- Fall Swarming (Mating) at Caves



Biological Assessment

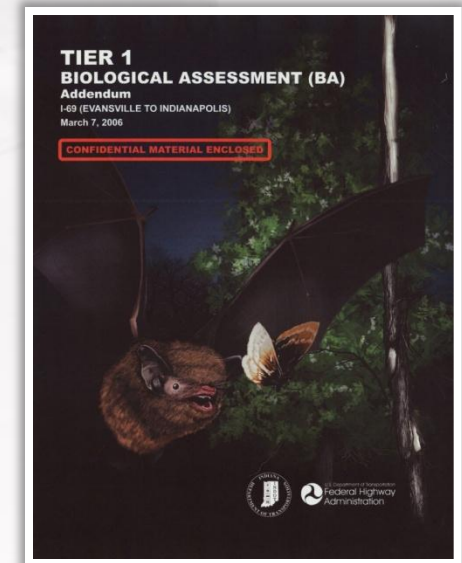
USFWS Biological Opinion

Biological Assessments require:

- Species for consideration
- Informal consultation & Formal consultation
- Biological Assessment incl. Landscape Connectivity & Biological Surveys
- Return of a Biological Opinion (BO) by USFWS on jeopardy or not on species and critical habitat



INCIDENTAL TAKE STATEMENT in BO



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Thank You

